

Operation Guide for
The **GAULIN** *Homogenizer*
Model CGD



MANTON-GAULIN MANUFACTURING CO.
EVERETT, MASS.

Instructions for the Care and Operation of MODEL CGD TWO-STAGE MANTON-GAULIN HOMOGENIZERS

Introduction

MANTON-GAULIN HOMOGENIZERS are rugged, heavy duty machines, built to withstand long years of service. Like all good equipment, however, it will last longer and give better service if properly treated. A proper understanding of the Homogenizer is therefore very important. Essentially the Homogenizer is a three plunger, positive displacement pump, built to withstand the high pressures necessary for proper homogenization. For details of its driving-mechanism, see our Bulletin 30-D.

The product being processed, enters the suction manifold in the bottom of the cylinder block which is bolted on the front of the machine. On the back or suction stroke of each plunger the product is pulled through the suction valves into the piston chamber. On the forward or pressure stroke it is then pumped through the discharge valves, and forced out through the homogenizing valves, which are mounted in a separate valve body on the side of the cylinder block. The entire purpose of the driving mechanism and the cylinder block assembly is merely to pump the product through these homogenizing valves. If the valve body containing the homogenizing valves was taken off the machine, it would merely be a pump, and is used as such for spray drying of many products where homogenizing is not necessary,

but a high pressure, sanitary pump is called for.

Should any trouble develop in the Homogenizer there is therefore one essential thing to consider—is the product itself inferior or is it a mechanical trouble? In the former case, the homogenizing valves should be checked as these alone determine the quality of the product. If the latter case, there is something wrong with the pump mechanism. For more complete details on actual operating troubles, consult our Question & Answer booklet.

Steps for Installation

I. Leveling the Machine

Homogenizers from 200 to 1000 gallon capacity have four base legs, which you will find wrapped inside the machine. Adjust these legs so the machine is as near level as possible. On the 1250 to 2500 gallon Homogenizer there are six legs. These should be adjusted so that all six legs are firmly on the floor, not only to hold the machine level, but to prevent any excess vibration. Before inserting the legs fill the threads with a paste made of flake graphite and oil.

II. Wiring the Motor

Be sure a competent electrician wires the motor and carefully insulates the motor leads. When so doing, check the rotation of the motor in accordance with the arrow mounted on the motor

THE MANTON - GAULIN

itself. As a double check, standing on the belt drive side of the machine, the vee belt drive should be running in a counter clockwise rotation. Always check the bearings on motor for proper lubrication.

III. Cooling Water

A supply of city water should be connected to the machine for cooling and lubricating the plungers. On the 75 gallon through 500 gallon units, this connection is on the side of the base up near the cylinder block. There should be a valve in this water line to control the amount of water flowing on the plungers. On the 650 through 2500 gallon machines, the water intake is from the bottom of the base. On machines from 1250 up, the same water runs thru the oil cooler, keeping the oil at as low an operating temperature as possible.

IV. Oiling

Fill the machine up to the proper oil level, (after checking to be sure no dirt has entered oil well since shipping), with a straight run turbine type oil, approximately 50 SAE viscosity. Complete technical oil specifications are given on a plate mounted on the machine. Approximately two gallons of oil are required for the 75 and 125 gallon machines; four gallons for the 200 to 500 gallon machines; six gallons for the 650 through the 1000 gallon; eleven gallons for the 1250 through 2500. Too high an oil level in the base of the machine will permit the oil to flow out along the drive shaft and leak down on the vee belt drive. Be sure therefore to watch the

mark on the oil level gauge. Be sure that the oil pressure gauge indicates some oil pressure when running. Any pressure from 10 lb. - 60 lb. is satisfactory.

V. Piping

The intake manifold connection on machines from 75 gallons to 500 gallons is a 1½" sanitary ferrule. On machines over 500 gallons it is a 2" sanitary fitting. It is suggested that gasket type sanitary fittings be used on suction side to prevent air leaks. The discharge ferrule on all sizes is a 1½" sanitary connection. On the discharge side it is often advisable to have 7 B or 7 UR sanitary tee screwed direct onto Homogenizer outlet and a 10-F two-way valve on the side of this tee. When starting the Homogenizer the product can then be drawn off until the machine is up to operating pressure, thereby eliminating any chance for unhomogenized product to get through. Never put a valve on the discharge side which can stop the flow of product entirely. The instantaneous pressure built up by closing the discharge line can cause serious damage.

VI. Cleaning

Clean the Homogenizer prior to putting it in service. The Homogenizer is thoroughly cleaned prior to shipment from the factory, but it is always possible for dirt and foreign materials to get in the machine before it is actually put in operation at the plant. It is also possible that solder and other impurities have accumulated in hooking up the pipe line and will be pulled into the machine. After an initial cleaning therefore

TWO-STAGE HOMOGENIZER

run a hot alkali rinse through the entire system of the Homogenizer to wash out all impurities. Follow this with a generous supply of hot water, then disassemble the cylinder block and wash it out thoroughly again. When reassembled, the machine is ready for operation. Always bear in mind that the machine has been thoroughly tested and inspected at the factory prior to shipment and is guaranteed to be in perfect operating conditions when shipped.

Starting Instructions

Turn on water for piston rinse. Check lubrication. Check direction of rotation. Back off pressure regulating handles so there is no pressure against homogenizing valves. Start Homogenizer. Open supply valve. If product does not come through in a few seconds check suction line for leaks. Direct product from discharge line at draw off valve and when the Homogenizer is delivering its full capacity, then build up the required pressure on the Homogenizer valves and redirect flow thru this discharge line. (See operation of 2 stage valve.) If gauge does not operate steadily a little air may be trapped, assuming pump valves are clean and well seated. This may work out in a few seconds. If it persists, backing off the pressure regulating handles may correct it. If this does not relieve the condition there is either something under the pump valves or there is a leaky suction line or for some reason there is not enough product reaching the Homogenizer to fill the cylinders on each stroke of the plungers. SEE OUR QUESTION & ANSWER BULLETIN for more complete information.

Cleaning the Machine

All cylinder fittings should be removed after each day's operation. To a new operator this may seem like a difficult task, but once familiar with the machine, a few minutes is sufficient to entirely strip all the fittings and wash them down thoroughly. All parts should be laid on a table to dry. Bear in mind that all these parts are machined to very close tolerances, and given a high polish. Damaging and denting of these parts will materially decrease their life. Be sure and handle carefully at all times.

Lubrication

Check the lubrication frequently. Be sure that there is ample oil in the machine at all times, and that on sizes from 200 gallons up, which are equipped with oil pumps, that there is sufficient oil pressure, as indicated by the oil pressure gauge. Due to the moist conditions in most dairies, condensation is bound to get in the oil, and this water should be drained off as often as necessary. This can be easily done when the machine has been standing for some time. The water, which is heavier than the oil, will settle to the bottom, and can be drained by means of a petcock or pipe plug located at the bottom of the base. If an appreciable amount of rinse, chlorine or wash water is pumped through the machine, or if the product being homogenized has no lubricating qualities, it is advisable at the time of assembly to use a small amount of petroleum jelly No. 2 on the leather packing rings. This lubricant will also facilitate the sealing of hard gaskets; and it also adds to the life of all wearing parts and all the threads.

THE MANTON-GAULIN

Adjustment of Plunger Packing

Most of the Homogenizers being shipped today are equipped with a single ring of U leather packing. This packing is so designed that the pressure inside the cylinder block will force the lips of the packing against the plunger, and also seal against the inside of the stuffing box. It is not necessary therefore to bring this packing up too tightly. Only tighten it enough to prevent movement of the packing back and forth with the plunger. It will frequently be found, if the packing is leaking that by backing up the packing adjusting screw the leaking will stop, whereas if it is tightened up it will leak more.

Operation of Two-Stage Valve

The two stage valve was developed to control viscosity. In order to do a proper job one should understand the operation of it. The first stage valve is the one through which the product passes first on leaving the cylinder block. The second stage valve is the second or last valve through which the product passes. As a rule, a low pressure on the second stage valve will mean a lower viscosity product—a high pressure on the second stage valve will give a high viscosity. When building up the pressure, always put the pressure on the second stage valve first. This transmits pressure through the homogenizing valve body

assembly back into the cylinder block, and shows a pressure reading on the gauge mounted on the other end of the cylinder block. Then build up pressure on the first stage valve—closing down the first stage valve will increase the pressure in the cylinder block, and thus show an increased pressure on the gauge. It will not, however, affect the original pressure set up on the second stage valve, which pressure will remain in the chamber between the first and second stage valve. What this actually means therefore, is that the product is coming from the cylinder block under the pressure which the gauge reads through the first stage valve into a pressure atmosphere originally set up by the second valve. From this intermediary pressure it then discharges through the second stage valve to atmospheric pressure. There are therefore two controlled pressure drops, with the resulting control in homogenization.

Ordering of Parts

Bulletin 821 contains fully illustrated all parts of the Homogenizer which it will ever be found practical to replace. When ordering these parts be sure and give the part number and name of the item required and the serial number of your Homogenizer. This will eliminate any holdups for lack of information and insure your getting the parts actually required.

For detail cuts illustrating design and operation of this machine see Bulletin 821.

BULLETIN 821 - A

90
70 -

2PM HUM
84, 56

A7325

8

○